

Wheaton Library and Community Recreation Center: Traffic Impact Study

Wheaton Library and Community Recreation Center

Traffic Impact Study

August 10, 2015

Prepared for



Montgomery County
Department of General Services

Prepared by



STV Incorporated
7125 Ambassador Road, Baltimore, Maryland 21244

What is a Traffic Impact Study?

A Traffic Impact Study is a study to evaluate the impact on a roadway network due to a proposed development.



Traffic Impact Study Overview

1. Analysis of Existing Conditions
2. Analysis of Background Conditions
3. Analysis of Total Future Conditions

Analysis of Existing Conditions

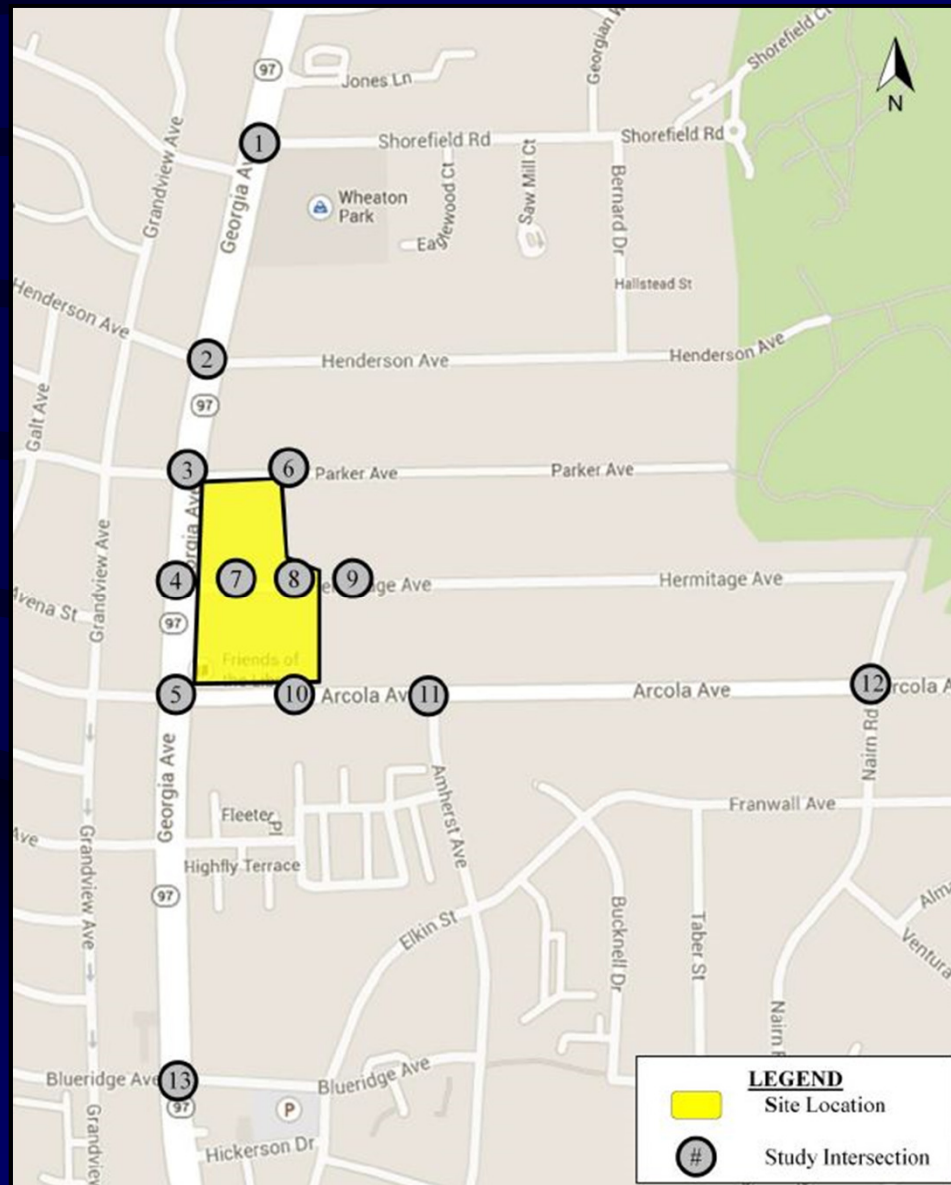
An analysis to assess current traffic operations in the vicinity of the development.

Based on Current
Traffic Data Collection

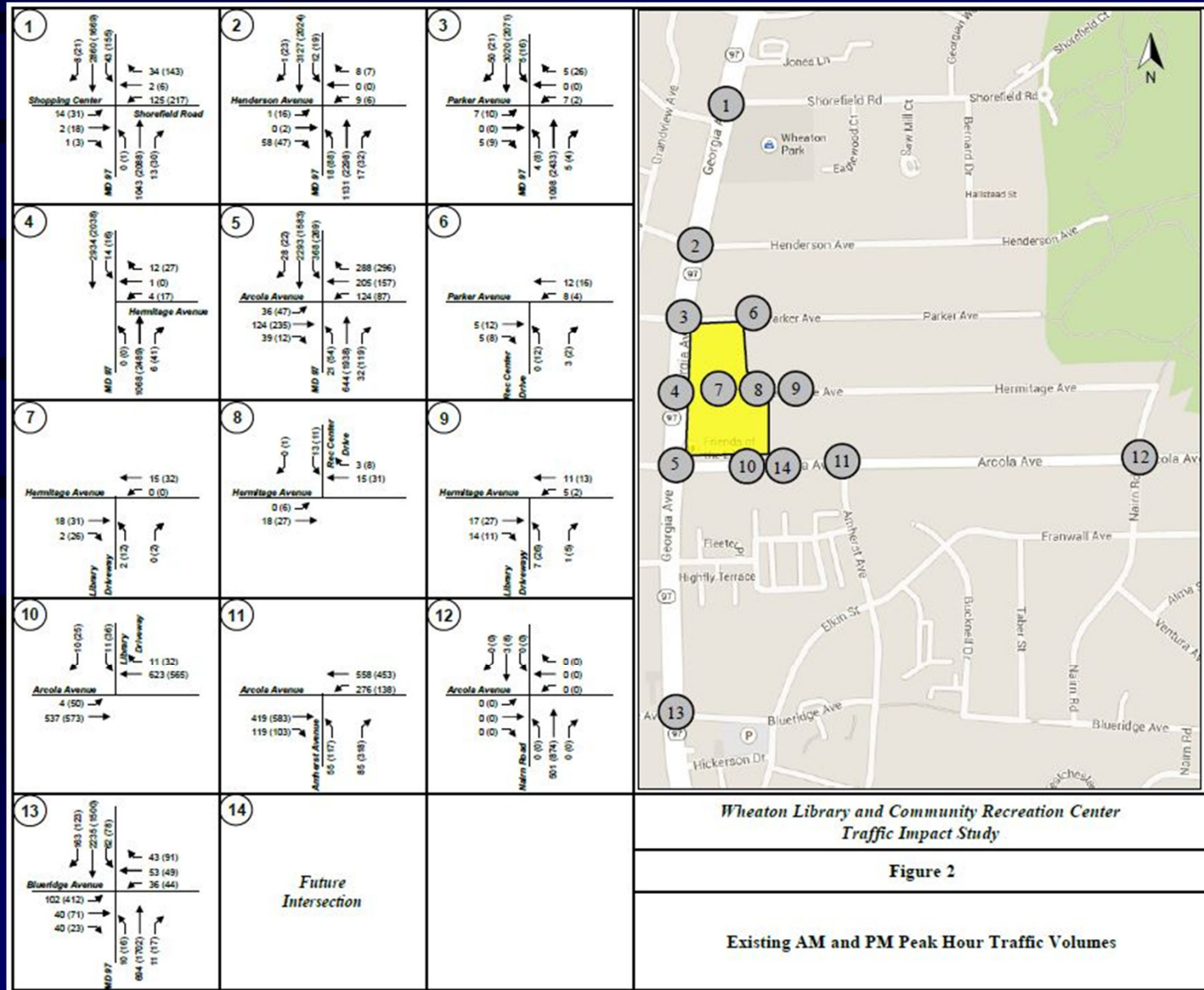
- Peak Hour Counts
- Lane Configurations



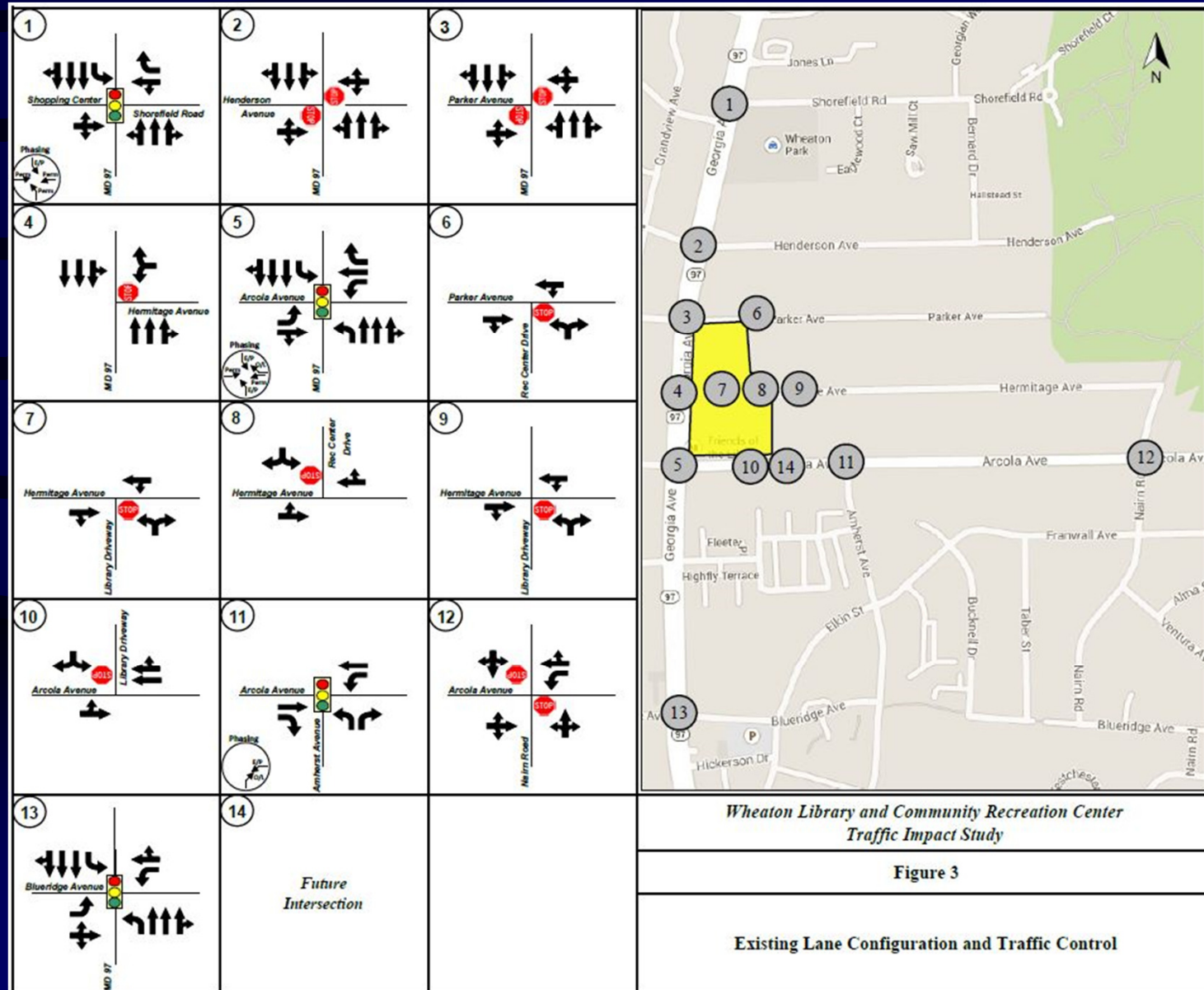
Location Map



Existing Volumes



Existing Lane Configurations and Traffic Control

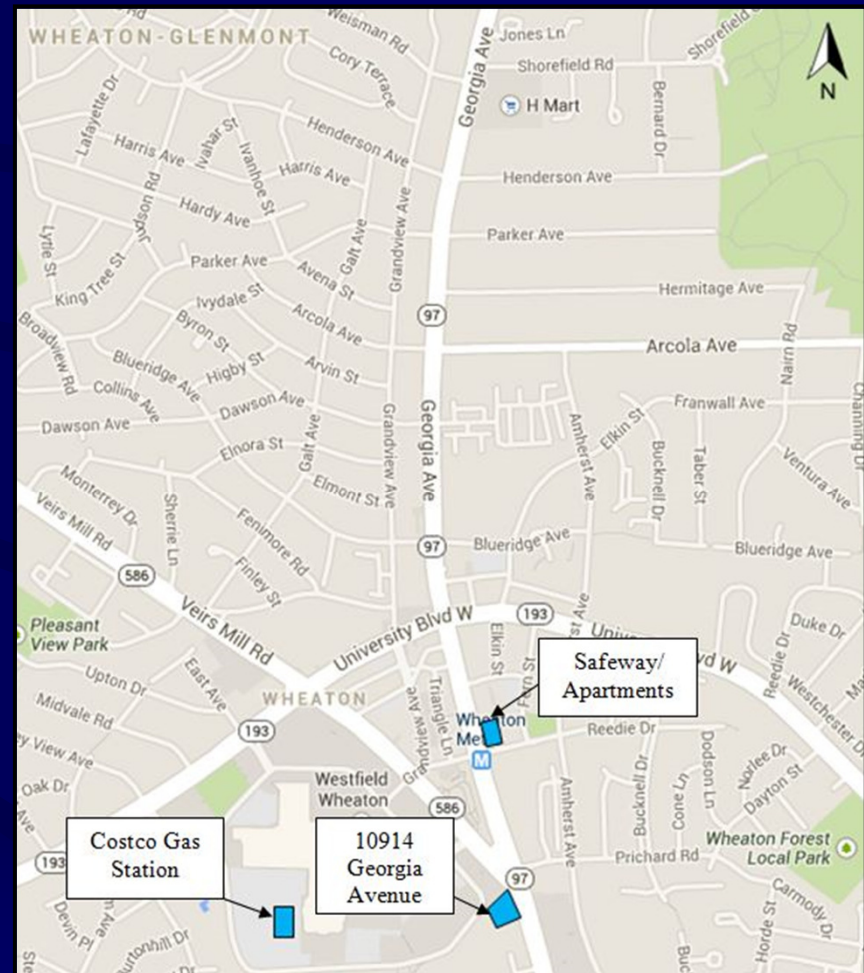


Critical Lane Volume (CLV) Example

Montgomery County Department of Transportation Turning Movement Summary and Level of Service										Prepared by: STV, Inc.																																																																																	
Count Date: 9/12/2013					Location: MD 97 at Blueridge Avenue (Intersection 13)																																																																																						
Conditions: Existing					Computed by: RMW					Date: 8/7/2015																																																																																	
Design Year:																																																																																											
<div style="display: flex; justify-content: space-between;"> <div> <p>Morning Peak Hour: 7:30-8:30 AM</p> </div> <div> <p>Evening Peak Hour: 5:15-6:15 PM</p> </div> </div>																																																																																											
<div style="display: flex; justify-content: space-between;"> <div> <p>RTOR/Overlap</p> <input type="checkbox"/> Northbound <input type="checkbox"/> Southbound <input type="checkbox"/> Eastbound <input type="checkbox"/> Westbound </div> <div> <p>Split Phasing</p> <input checked="" type="radio"/> East/West <input type="radio"/> North/South <input type="radio"/> None </div> <div> <p>Inx. Control</p> <input checked="" type="radio"/> Signal <input type="radio"/> Stop </div> </div>																																																																																											
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Analysis of Background Conditions

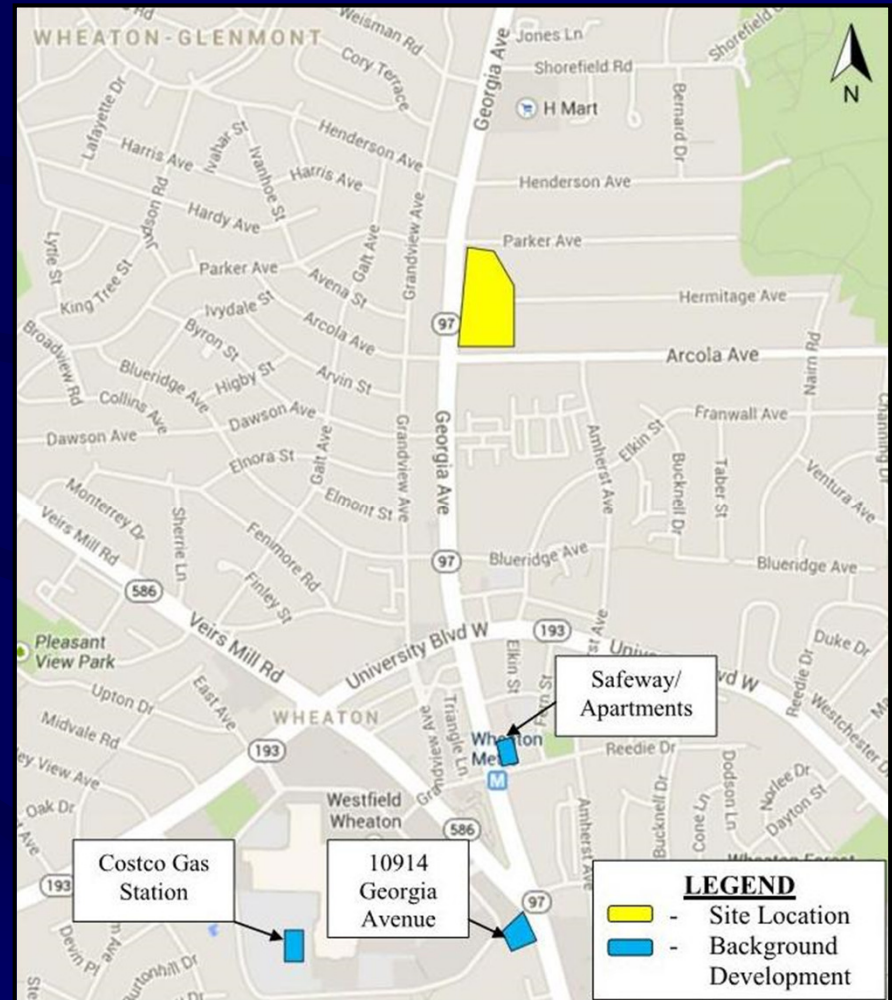
An analysis of conditions in the build year prior to the completion of the subject development.



Analysis of Future Conditions

An analysis to assess whether the intersections within the study area are impacted by the subject development.

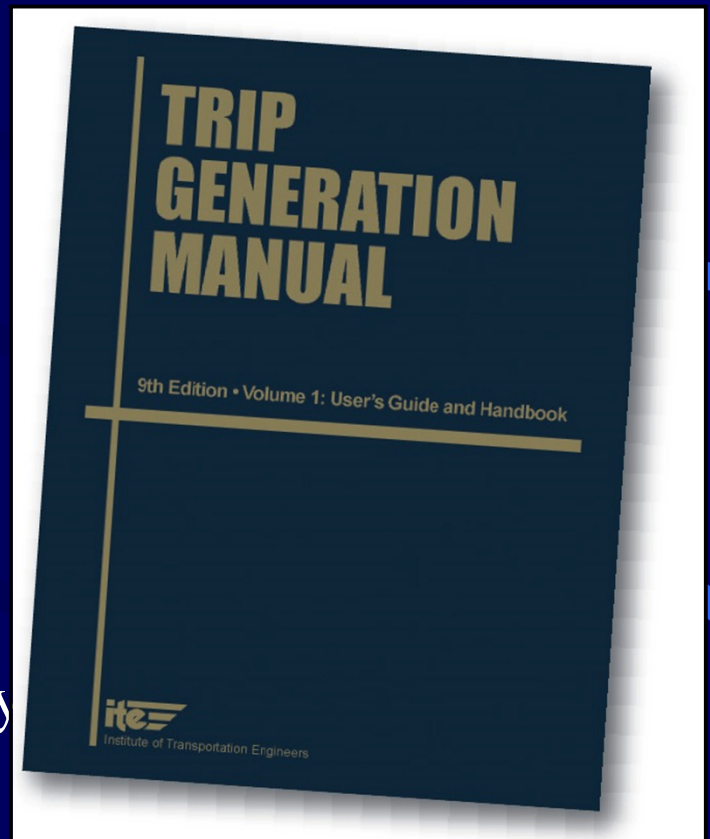
Conclusions and Recommendations – Mitigation if Required



Trip Generation

The number of trips generated were estimated using the Trip Generation Manual published by ITE.

- Accepted as the industry standard
- Number of trips are based on the land use and square footage of the proposed development
- Based on studies done at actual developments throughout the country



Trip Generation (continued)

General Office Building (710)

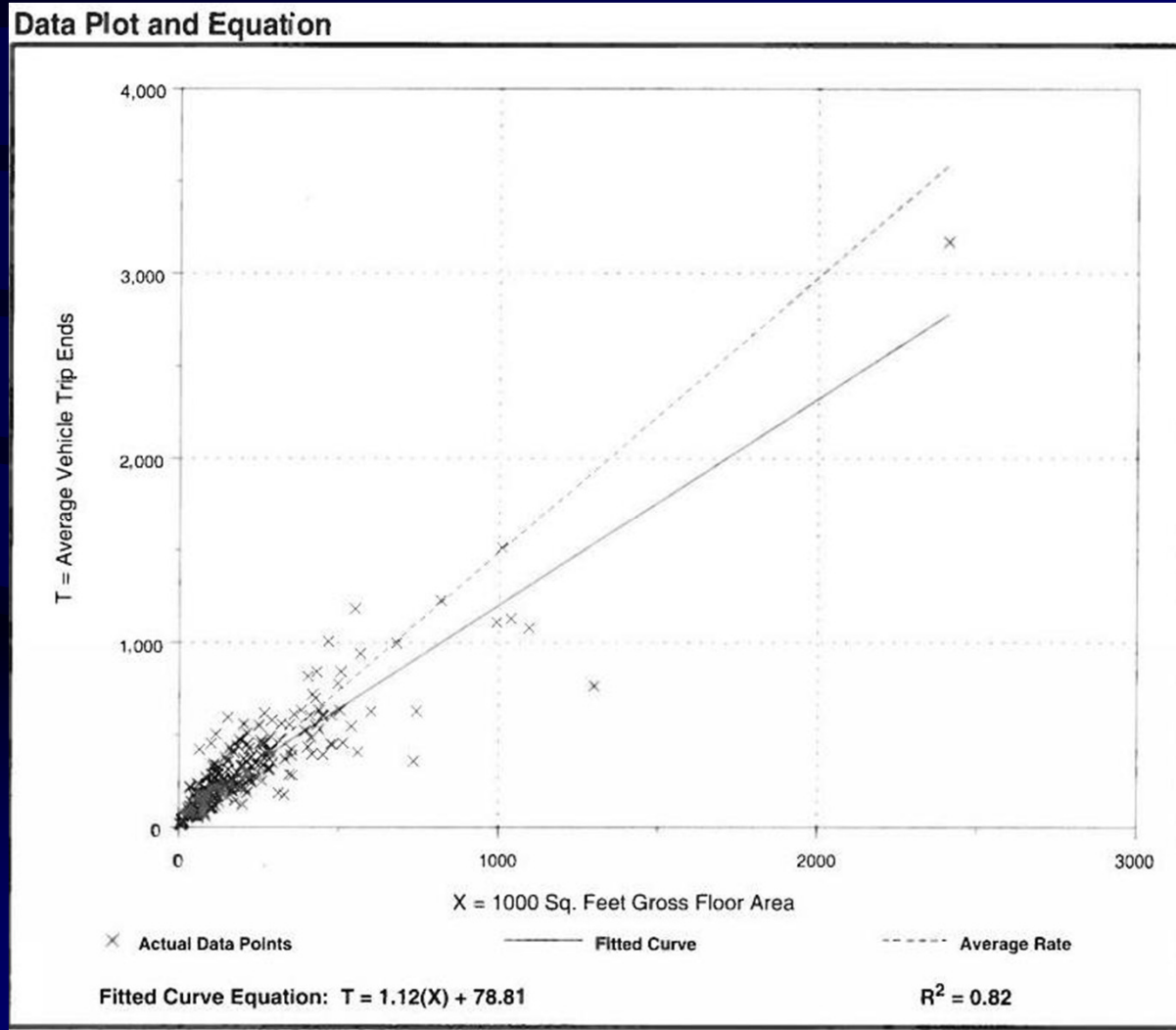
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
P.M. Peak Hour

Number of Studies: 235
Average 1000 Sq. Feet GFA: 216
Directional Distribution: 17% entering, 83% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.49	0.49 - 6.39	1.37

Trip Generation (continued)



Trip Generation

- No new trips are anticipated for the library since the proposed library (39,812 SF) is smaller than the existing library (45,738 SF).
- The community recreation center will not generate trips during the AM peak hour (7-8 AM) because it is not anticipated to be open during the AM peak hour.
- The proposed community recreation center (54,188 SF) will generate trips during the PM peak hour due to the increase in square footage compared to the existing recreation center (15,724 SF) and fact that it will be open.

Peak Hour of:	Trip Type	AM Peak Hour		PM Peak Hour	
		In	Out	In	Out
Adjacent Street Traffic (7:00 - 8:00 AM) (5:30 - 6:30 PM)	Library	0	0	0	0
	Community Recreation Center	0	0	21	35
	Total	0	0	21	35

Trip Generation (continued)

Recreational Community Center (495)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 4
Average 1000 Sq. Feet GFA: 73
Directional Distribution: 37% entering, 63% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.45	1.05 - 2.78	1.28

Analysis of Future Conditions

An analysis to assess whether the intersections within the study area are impacted by the subject development.

Conclusions and Recommendations:

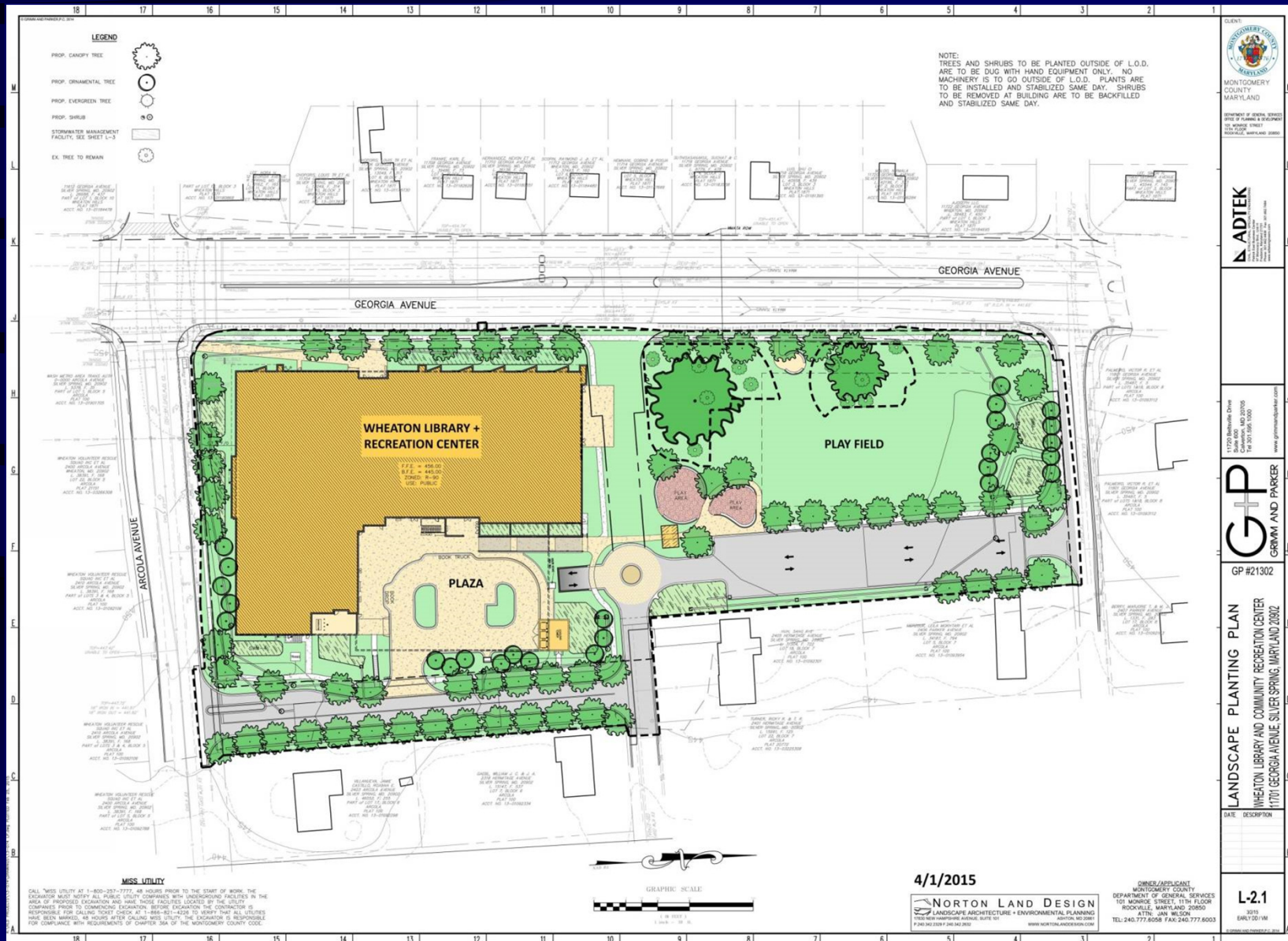
1. Critical Lane Volume Results
2. Signal Warrant Analysis Results

LOS Criteria

Intersection	Existing		Background		Total Future	
	AM Peak Hour (CLV/LOS)	PM Peak Hour (CLV/LOS)	AM Peak Hour (CLV/LOS)	PM Peak Hour (CLV/LOS)	AM Peak Hour (CLV/LOS)	PM Peak Hour (CLV/LOS)
1. Georgia Avenue at Shorefield Road	1,216/C	1,231/C	1,216/C	1,231/C	1,216/D	1,238/D
2. Georgia Avenue at Henderson Avenue	1,273/C	1,117/B	1,273/C	1,117/B	1,273/C	1,123/B
3. Georgia Avenue at Parker Avenue	1,174/C	971/A	1,174/C	971/A	1,174/C	996/A
4. Georgia Avenue at Hermitage Avenue	1,127/B	996/A	1,127/B	996/A	-	-
5. Georgia Avenue at Arcola Avenue	1,176/C	1,368/D	1,176/C	1,368/D	1,178/C	1,418/D
6. Parker Avenue at Rec Center Drive	24/A	38/A	24/A	38/A	24/A	61/A
7. Hermitage Avenue at Library Driveway (west)	22/A	71/A	22/A	71/A	-	-
8. Hermitage Avenue at Rec Center Drive	31/A	57/A	31/A	57/A	-	-
9. Hermitage Avenue at Library Driveway (east)	44/A	71/A	44/A	71/A	62/A	210/A
10. Arcola Avenue at Library Driveway	570/A	839/A	570/A	839/A	-	-
11. Arcola Avenue at Amherst Avenue	750/A	901/A	750/A	901/A	750/A	904/A
12. Arcola Avenue at Nairn Road	867/A	941/A	867/A	941/A	867/A	954/A
13. Georgia Avenue at Blueridge Avenue	1,090/B	1,122/B	1,090/B	1,122/B	1,090/B	1,125/B
14. Arcola Avenue at Hermitage Relocated	-	-	-	-	393/A	539/A

*CLV over 1,600 is considered failing

Traffic Signal Warrants



Signal Warrant Criteria

- Warrant 1 – Eight Hour Vehicular Volume
- Warrant 2 – Four Hour Vehicular Volume
- Warrant 3 – Peak Hour
- Warrant 4 – Pedestrian Volume
- Warrant 5 – School Crossing
- Warrant 6 – Coordinated Signal System
- Warrant 7 – Crash Experience
- Warrant 8 – Roadway Network

[*Refer to MUTCD for more information](#)

Warrant 1 – Eight Hour Vehicular Volume

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	500	400	350	280	150	120	105	84
2 or more....	1.....	600	480	420	336	150	120	105	84
2 or more....	2 or more....	600	480	420	336	200	160	140	112
1.....	2 or more....	500	400	350	280	200	160	140	112

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	750	600	525	420	75	60	53	42
2 or more....	1.....	900	720	630	504	75	60	53	42
2 or more....	2 or more....	900	720	630	504	100	80	70	56
1.....	2 or more....	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.

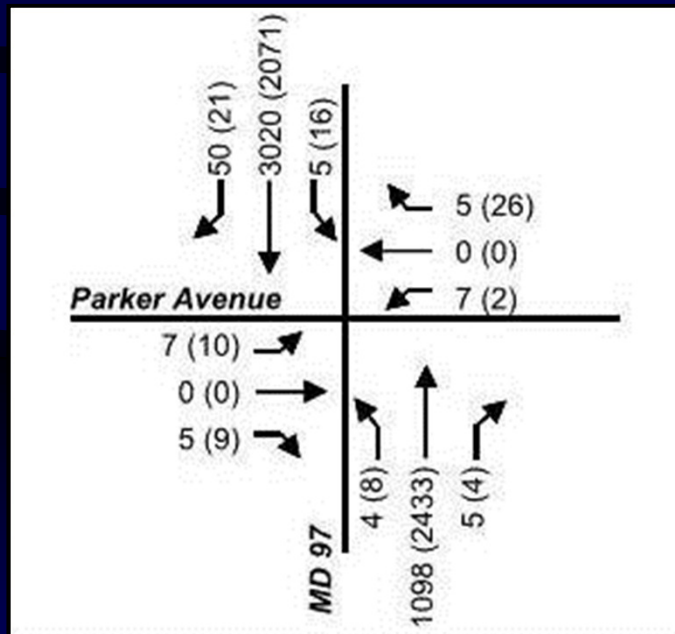
^b Used for combination of Conditions A and B after adequate trial of other remedial measures.

^c May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

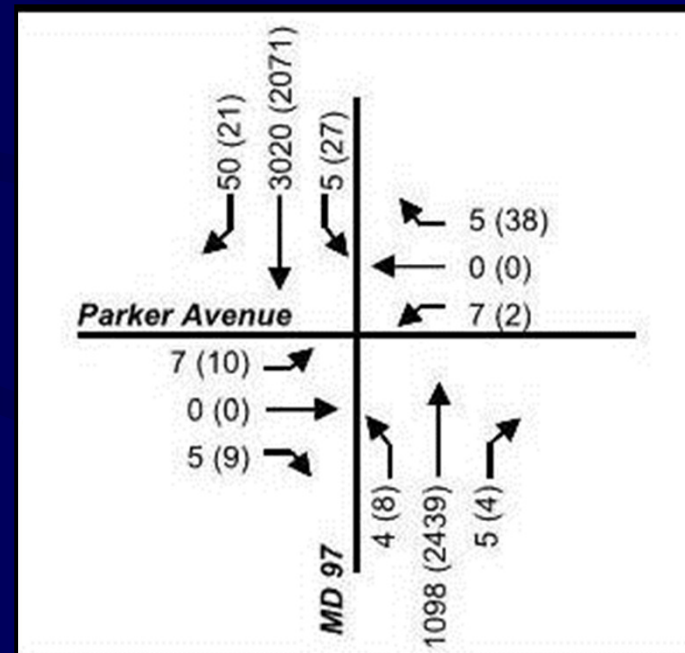
^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

Georgia Avenue at Parker Avenue

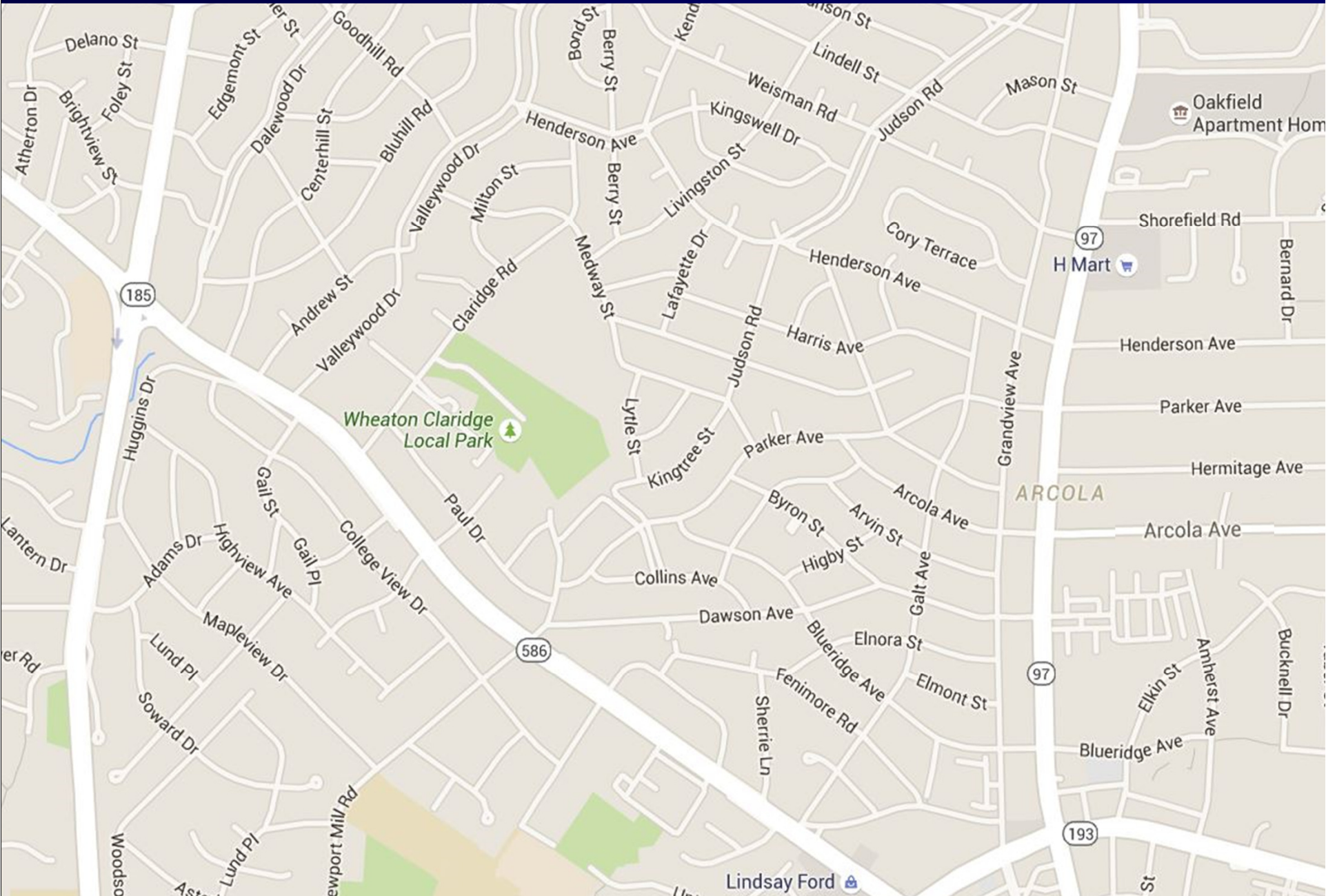
Existing Volumes



Future Volumes



State vs. County Roads



Questions?

